Title: RUMBLE STRIPS RESPONSIVE SYSTEMS Inventor(s): Hiroshi KAWAZOE et al. Appl. No.: 10/811,148 FIG.1 BRAKE CONTROL UNIT TO FRONT BRAKE UNITS 7190 AUDIO UNIT ENG/AT CONT. UNIT 180 INDICATOR 150 BRAKE SW TO BRAKE CONTROL UNIT 102

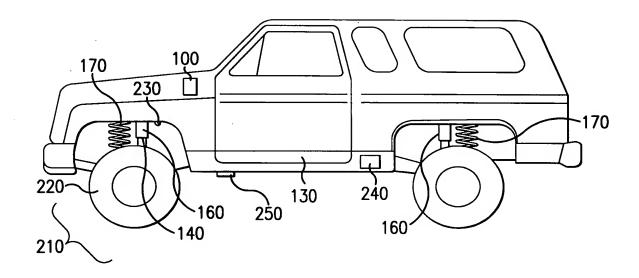


FIG.2

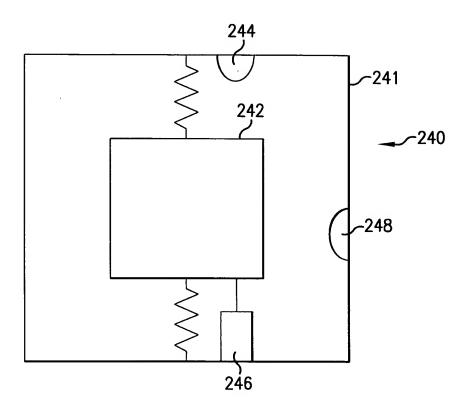


FIG.3

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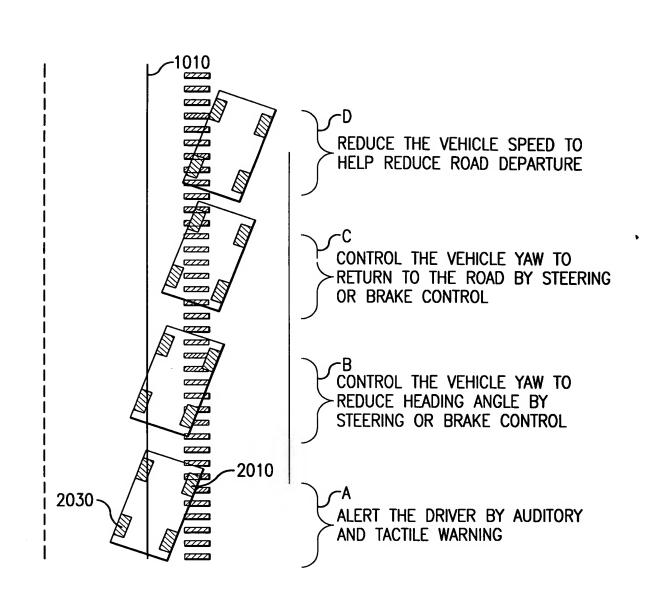


FIG.4

CALCULATION OF THE LATERAL SPEED AT DEVIATION

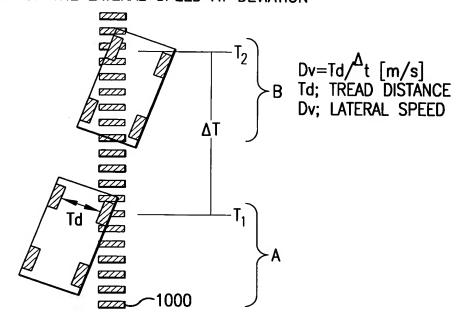


FIG.5a

CALCULATION OF THE HEADING ANGLE AT DEVIATION

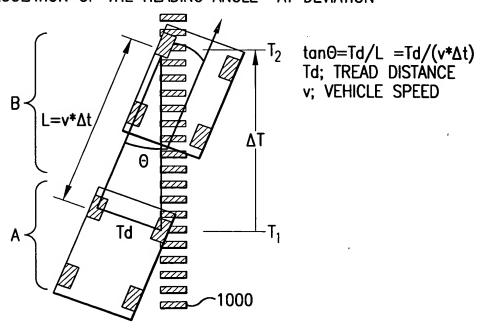


FIG.5b

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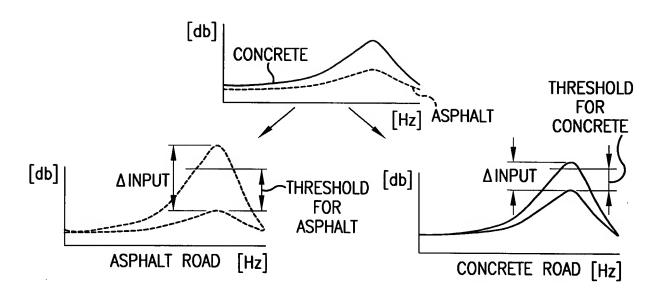


FIG.6

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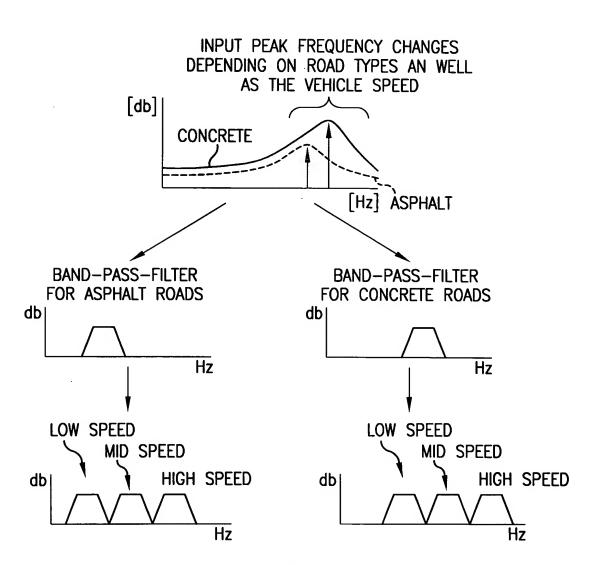
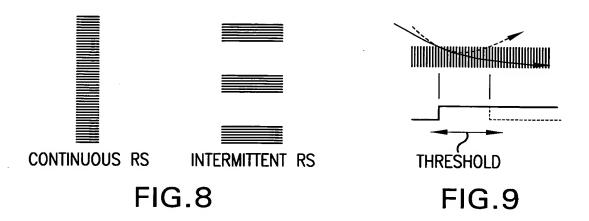
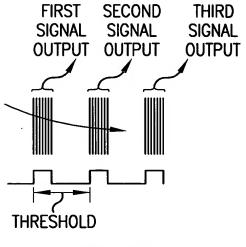


FIG.7

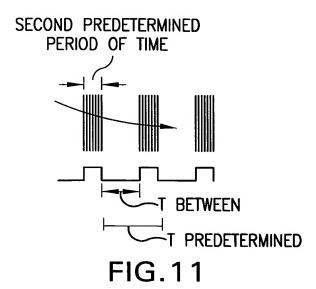
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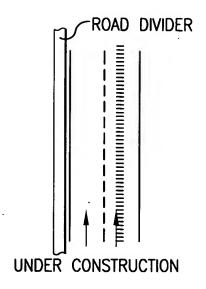


FIG.12

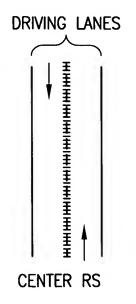


FIG.13

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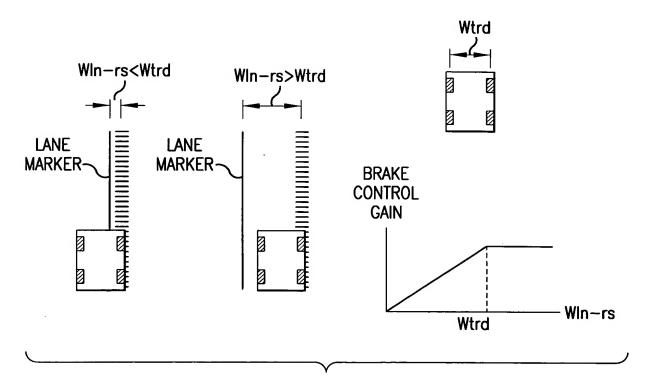
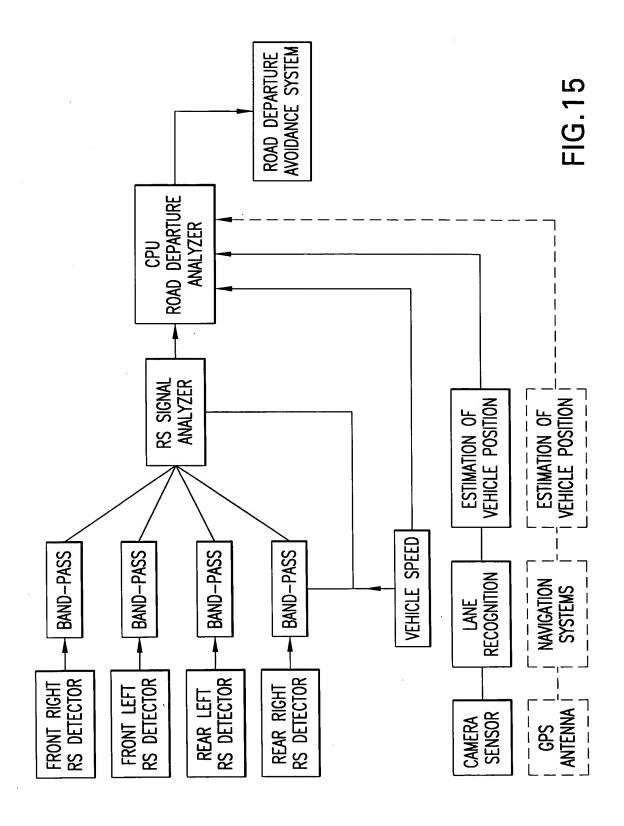


FIG.14



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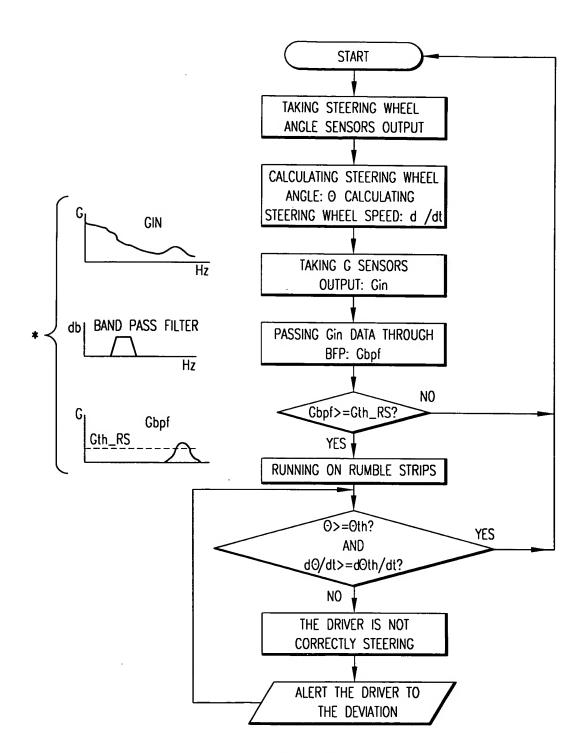


FIG.16

EXEMPLARY CUT-OFF FREQUENCIES OF BAND-PASS FILTER IN RESPONSE TO VEHICLE SPEED. THE PATTERN OF RUMBLE STRIPS: CYCLE DISTANCE: 30.48cm (1 FOOT) 140+km/h 128Hz BPF#1 120~140km/h 109 Hz BPF#2 100~120 km/h 91 Hz BPF#3 80~100km/h 72 Hz BPF#4 60~80km/h 55Hz BPF#5 db1 BAND-PASS-FILTER #5 **START** Hz GIN TAKING G SENSOR OUTPUT: Gin BAND-PASS-FILTER #4 Hz TAKING VEHICLE SPEED BAND-PASS-FILTER #3 SELECT BPF#1-#5 Hz PASSING Gin THROUGH BAND-PASS-FILTER #2 SELECTED BPF#x Hz Gbpf Gth_RS Gbpf>=Gth_RS? BAND-PASS-FILTER #1 Ηz RUNNING ON RUMBLE STRIPS

FIG.17

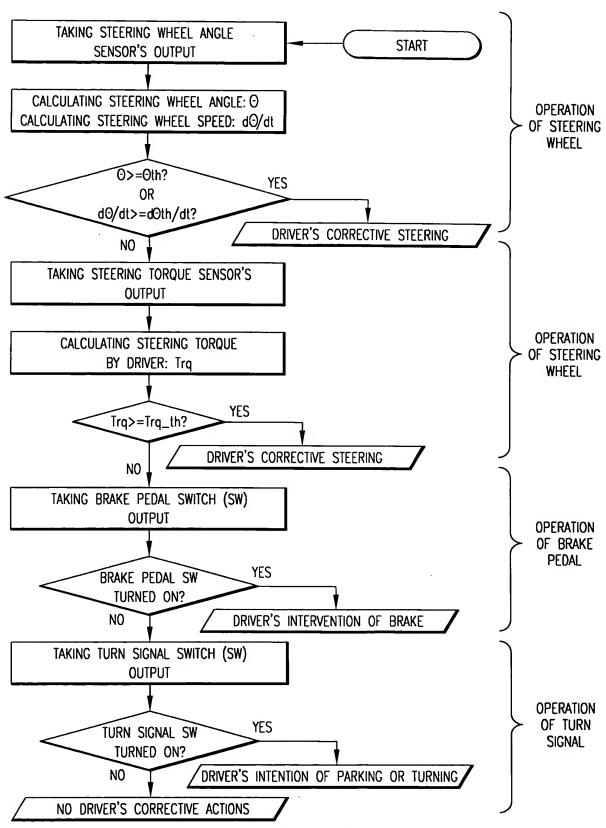


FIG.18

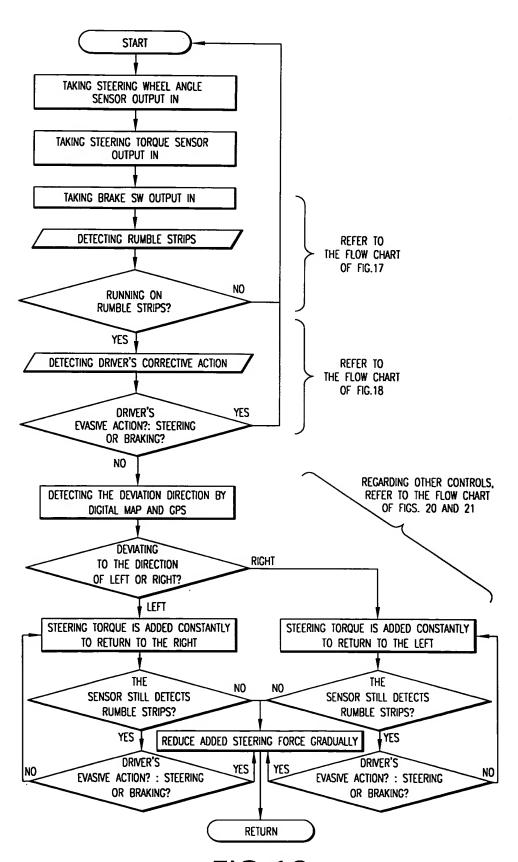


FIG.19

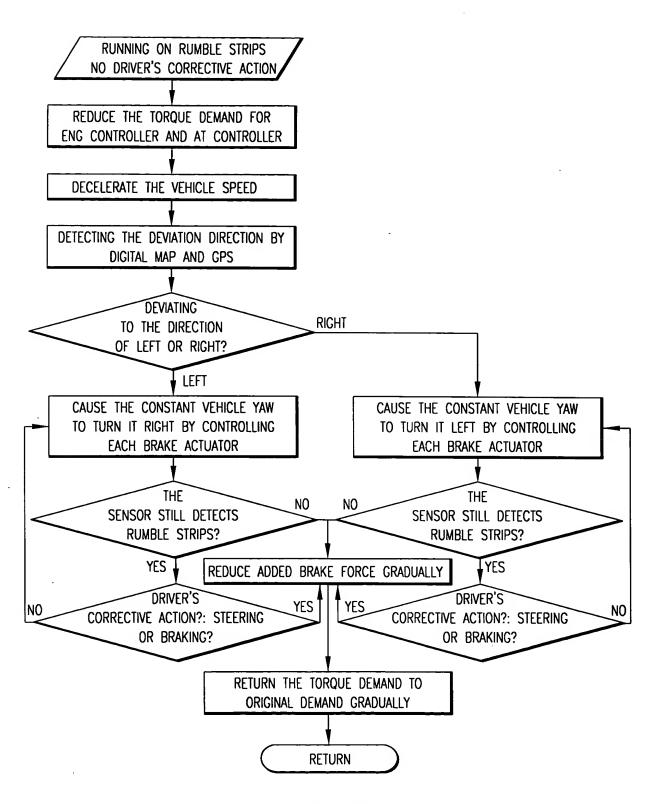


FIG.20

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RUNNING ON RUMBLE STRIPS
NO DRIVER'S CORRECTIVE ACTION

PRE-TENSIONING EACH SEAT BELT

OF FIG. 19

PRE-TENSIONING EACH SEAT BELT

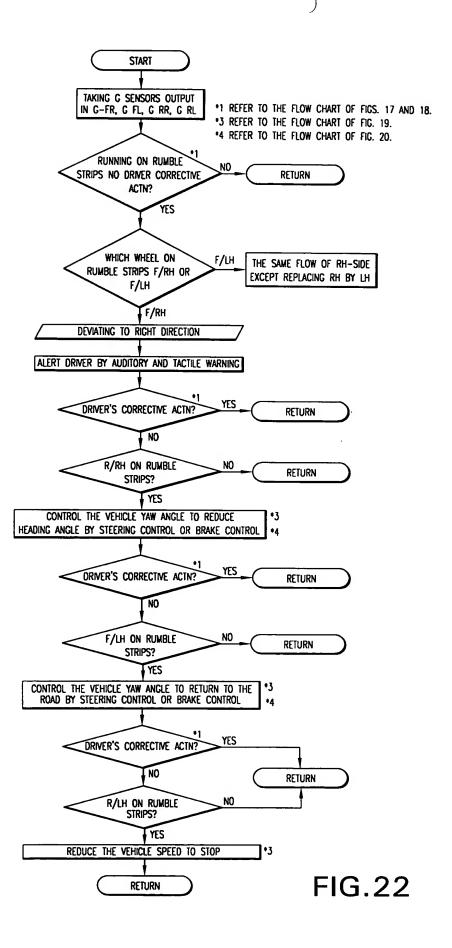
OR BRAKING?

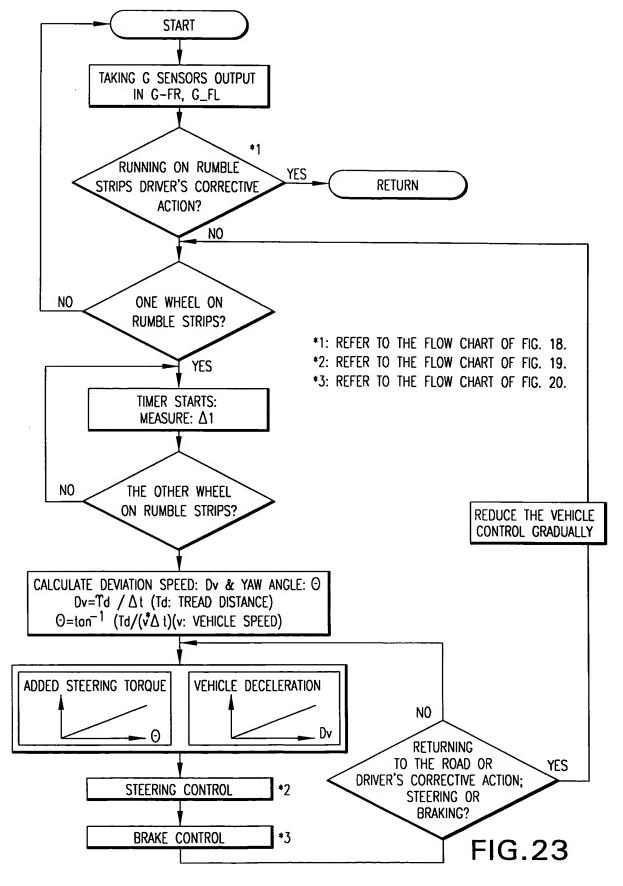
YES

RELEASE THE PRE-TENSION OF EACH SEAT BELT

RETURN

FIG.21





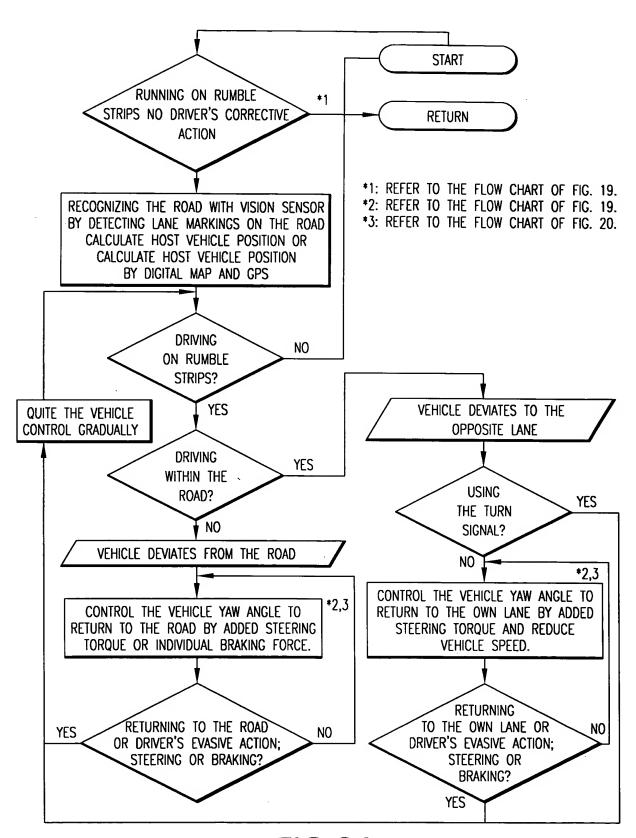


FIG.24

